Modifications to the Underground Communication Duct Bank Systems

Environmental Assessment

May 1994

John C. Stennis Space Center
National Aeronautics and Space Administration
Stennis Space Center, MS 39529-6000

ENVIRONMENTAL ASSESSMENT

MODIFICATIONS TO THE UNDERGROUND COMMUNICATION DUCT BANK SYSTEMS

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ABSTRACT

NASA is planning modifications and extensions to the underground communication distribution system duct banks throughout the SSC facility. The proposed changes will not result in substantial physical impacts to the environment. A Finding of No Significant Impact is recommended

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1.0 SUMMARY AND CONCLUSIONS

1.1 Proposed Action

The National Aeronautics and Space Administration (NASA) is planning restorations and extensions to the existing underground communication duct bank system throughout Stennis Space Center SSC). The existing underground communication duct bank system is at maximum capacity and restoration is necessary in many areas due to blockage and age of the system. Modification to the existing system will also allow SSC the ability to meet future communication requirements. Additional duct capacity is critical to providing adequate, reliable communication services to existing facilities and to new, proposed facilities. Approximately 9,200 linear meters (29,521 feet) of duct bank will be restored and/or installed. Double bay manholes will also be installed to better maintain the system.[1]

An environmental assessment of the proposed project is being conducted to comply with the requirement of the National Environmental Policy Act (NEPA). The proposed action involves improvements to the existing duct bank system consisting of the installation of double bay manholes and restoration of underground communication lines to essential facilities located around the SSC fee area. Environmental impacts are temporary as a result of excavation activities associated with installation of the duct banks and associated double bay manholes. Except for manhole locations, excavated areas will be restored to pre-installation conditions once the project is complete.

1.2 Alternative Actions

The alternative actions evaluated are the installation of an above ground communication system or direct burial. Due to the size of the communication cable required, above ground installation is not cost-effective, and direct burial of this cable will reduce system flexibility and maintainability.[1] Above ground pole suspension of the communication cable exposes the system to risk of damage and additional, excessive load on existing distribution poles.

1.3 No Action

The no-action alternative would prevent restoration of the existing communication system resulting in decreasing reliability. In addition, enhanced communication modifications would be not be able to be provided to existing and proposed facilities.

1.4 Environmental Consequences

Minimal environmental consequences will result from the installation of this system. Areas will be temporarily disturbed for installation of the duct banks and manholes with each area regraded and seeded to restore the area to pre-installation conditions. Construction activities will be conducted using a manageable, systematic approach through the installation of the duct banks and manholes section by section, thereby reducing the amount of exposed excavation area.[5]

1.5 Recommendation

A Finding of No Significant Impact (FONSI) is recommended since there will be minimal short-term and long-term environmental impacts from the proposed action.

2.0 PURPOSE AND NEED

The modifications to the SSC duct bank communication system are necessary to maintain and improve the reliability of the existing communication system and to provide expandable communication support to future needs. The existing underground communication duct bank system along the industrial area route is at maximum capacity and several of the ducts have become non-functional as a result of water penetration and "Orangeburg" (tar-impregnated paper) swelling. Additional duct capacity is critical for providing dependable communication services.

3.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVE ACTIONS

3.1 Proposed Action

The proposed project involves the restoration or installation of approximately 9,200 linear meters (29,521 feet) of an underground communication duct bank distribution system throughout the SSC fee area. Duct banks to be restored or installed include communications systems to Building 3202 [Rocketdyne Shuttle Building], Building 8100 [Laboratory Complex], Building 1100 Annex [Administrative Offices], the Component Test Facility [CTF] and the H-1 Static Test Complex. An updated communication distribution system is essential to provide adequate, reliable communication support to these areas. Restoration of the system includes the installation of double bay manholes throughout the system for proper maintenance. Areas of excavation associated with the project are provided in Figure 1.

Project work involves the excavation of areas to a maximum depth of 3 meters (9.6 feet). Excavation work will be performed on a section by section basis so that minimal trenching will remain open and minimal stockpiling of excavated material will result, thus minimizing erosion.[5] Areas will be regraded and restored upon installation of each

section of the distribution system. Typical construction details are provided in Figure 2.

3.2 Alternative Actions

The alternative actions evaluated are the installation of an above ground communication system and direct burial. Due to the size of the communication cable required, above ground installation is not cost-effective, and direct burial of this cable will reduce system flexibility and maintainability. Above ground pole suspension of the communication cable exposes the system to risk of damage and additional, excessive loads on existing distribution poles.

3.3 No Action

The no-action alternative would prevent restoration of the existing communication system and result in decreasing reliability of the existing system. In addition, future communication needs could not be provided to existing and proposed facilities without significant cost impacts.

4.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION AND THE ALTERNATIVES

4.1 Summary

This section summarizes the environmental effects resulting from the proposed modification of the underground duct bank communication system.

4.2 Air Quality Effects

Short-term fugitive air emissions will result from the excavation of the areas and the operation of heavy equipment such as backhoes, bulldozers, pumps, etc. No long-term, continuous air emissions are anticipated as a result of this project or its actual operation.

4.3 Water Quality Effects

No long term water quality effects are anticipated as a result of this project. No additional water demands, wastewater, stormwater or sanitary contributions are associated with this project. A minimal short-term impact is expected as a result of potential groundwater contacted during excavation activities. Any groundwater contacted that conflicts with installation operations will be removed, collected and discharged to surface drainage systems.

The areas of excavation are not located above an active or inactive hydrocarbon well nor above any active or inactive water well. Excavation of the areas are not anticipated to exceed 3 meters (9.6 feet) in depth.[1]

4.4 Wetland and Floodplain Impacts

The proposed project involves several specific areas of the SSC Fee Area as indicated in Figure 1. The SSC Fee Area was assessed by the U.S. Army Corps of Engineers, Vicksburg District for wetland determination.[2] Except for one section of the new distribution system that is discussed below, the excavated areas for installation of the distribution area are not considered in functional wetland areas and will not encroach on jurisdictional wetlands as defined by the Federal Manual for Identifying and Delineating Jurisdictional Wetlands.[3] The majority of the sites of excavation are along SSC roadways and maintained right of ways, as indicated in Figure 1. Any excess excavated soils will be used as fill material in approved, existing fill activities and will not impact wetland or floodplain areas.[4]

Certain sections of the distribution system that extend from east of Building 1005, southeast to the Component Test Facility involve trenching through an existing utility corridor that is comprised of hydric soil types. NASA has formally requested an exclusion under the provisions of the Nationwide Permit Program Regulations (30 CFR 330).[5] NASA has determined that there is no practicle alternative that will avoid siting in a wetlands.

The documented floodplains at SSC include a 100-year floodplain along the East Pearl River at the western edge of the Fee Area, and 100-year floodplains along the Wolf Branch and along the Lion Branch of Catahoula Creek in the northeast portion of the Fee Area. The project excavation activities are not associated with these areas. All excavated areas are considered Zone C per the Flood Insurance Rate Map of Hancock County, Mississippi, Panel 125 of 195, revised 18 September 1987, Federal Emergency Management Agency. Zone C is defined as areas of minimal flooding.[7]

4.5 Land Use/Flora and Fauna

SSC lies in the Lower Coastal Plain Physiographic Province of Mississippi, with the Buffer Zone surrounding the Fee Area extending into the Pine Hills Province. The site is underlain by a thick sequence of sedimentary deposits dipping to the south and west. The soils in the Fee Area are dominated by Atmore silt loam (At), the Smithton association (Su), and Escambia loam (EsA). These soils are generally composed of poorly to somewhat poorly drained silty and loamy soils. They are generally acidic with other significant characteristics of wetness, high organic matter, and weathered clay

mineralogy. SSC is located on the eastern edge of the Mississippi Embayment which is an area of some faulting and seismic activity further north in Missouri.[8]

Project work involves the excavation of areas to a maximum depth of 3 meters (9.6 feet). The removal of a small number of new growth trees may be required. Excavation work will be performed on a section by section basis so that minimal trenching will remain open and minimal stockpiling of excavated material will result.[6] Areas will be regraded upon installation or restoration of each section of the distribution system. Revegetation activities, to the extent prudent and appropriate will be initiated as soon as practicle after regrading. Native species will be used to the maximum extent possible.

4.6 Threatened and Endangered Species

Threatened and endangered species surveys for terrestrial fauna in the vicinity of the project have been reported by Drs. Edmond Keiser and Paul Lago[9] and for threatened and endangered botanical species in the surveys of Dr. Jean Wooten[10] and Cindy King.[11] Proposed construction and modification of the communication and distribution system should not adversely affect any species or species habitat possibly known to exist in the SSC fee area. There has not been any documented sightings of threatened or endangered species along the proposed areas of excavation.

4.7 Noise

Noise impacts are associated with the operation of heavy equipment and will be localized and short term. No long term noise impacts are associated with this project.

4.8 Historical, Archaeological and Cultural Impacts

During 1988, the Mobile District of the U.S. Army Corps of Engineers conducted an archaeological survey and reconnaissance of lands within the SSC fee area.[13] No archaeological resources were located on any of the land surveyed. The Mississippi Historic Preservation Office and the Archaeological Services Branch of the National Park Service concurred with these findings.

4.9 Socioeconomic Impacts

There will be no change in the number of jobs at SSC to complete the modifications to the underground communication duct bank system, therefore there will be no socioeconomic impact.

5.0 INDIVIDUALS AND ORGANIZATIONS CONSULTED

Table 1 provides information on the individuals and organizations consulted in the preparation of this environmental assessment document.

Individual	Organization	Area of Information
Anne Johnson	NASA - SSC Center Operations - Environmental Staff	Environmental Concerns
Ronald Magee	NASA - SSC Center Operations - Environmental Staff	Environmental Concerns
Andrew Clarke	NASA - SSC Center Operations - Construction	Engineering Design
Richard Rider	NASA - SSC Center Operations - Construction	Engineering Design
Carolyn Kennedy	Sverdrup Technology, SSC Group	Environmental Concerns
William Kennedy	Johnson Control World Services - Field Inspector	Construction and Operations
Lynn Landrum	Johnson Control World Services - Environmental	Environmental Regulations

6.0 REFERENCES

1 NASA Form 1509/1510: Facility Project - Brief Project Document: Restoration of Underground Communication Distribution System, Project code 94NCBZ, Revision B, January 1, 1994.

2 McGregor, E. G. U.S. Army Corps of Engineers, Vicksburg District. Correspondence to R. G. Magee, NASA. Jurisdictional Wetland Determination of SSC. June 1991.

3 Fish and Wildlife Service, Environmental Protection Agency, Department of the Army and Soil Conservation Service. Federal Manual for Identifying and Delineating Jurisdictional Wetlands. December, 1991.

4 Kennedy, William. Johnson Control World Services, Stennis Space Center, Inspector. Telephone Conversation of 12 April 1994 on excavation activities.

5 Magee, Ronald. NASA, Center Operations, Stennis Space Center, Environmental Officer. Correspondence to M. F. McNair, U.S. Army Corps of Engineers, Vicksburg District. April 18, 1994.

6 Rider, Richard. NASA, Center Operations, Stennis Space Center, Engineering. Telephone conversation of April, 1994 on excavation activities.

7 Federal Emergency Management Agency, Flood Insurance Rate Map: Hancock County, Mississippi, Panel 125 of 195. Community Panel Number 285254 0125 C, Map Revised, September 18, 1987.

8 National Aeronautics and Space Administration. Environmental Resources Document. John C. Stennis Space Center. September 1992.

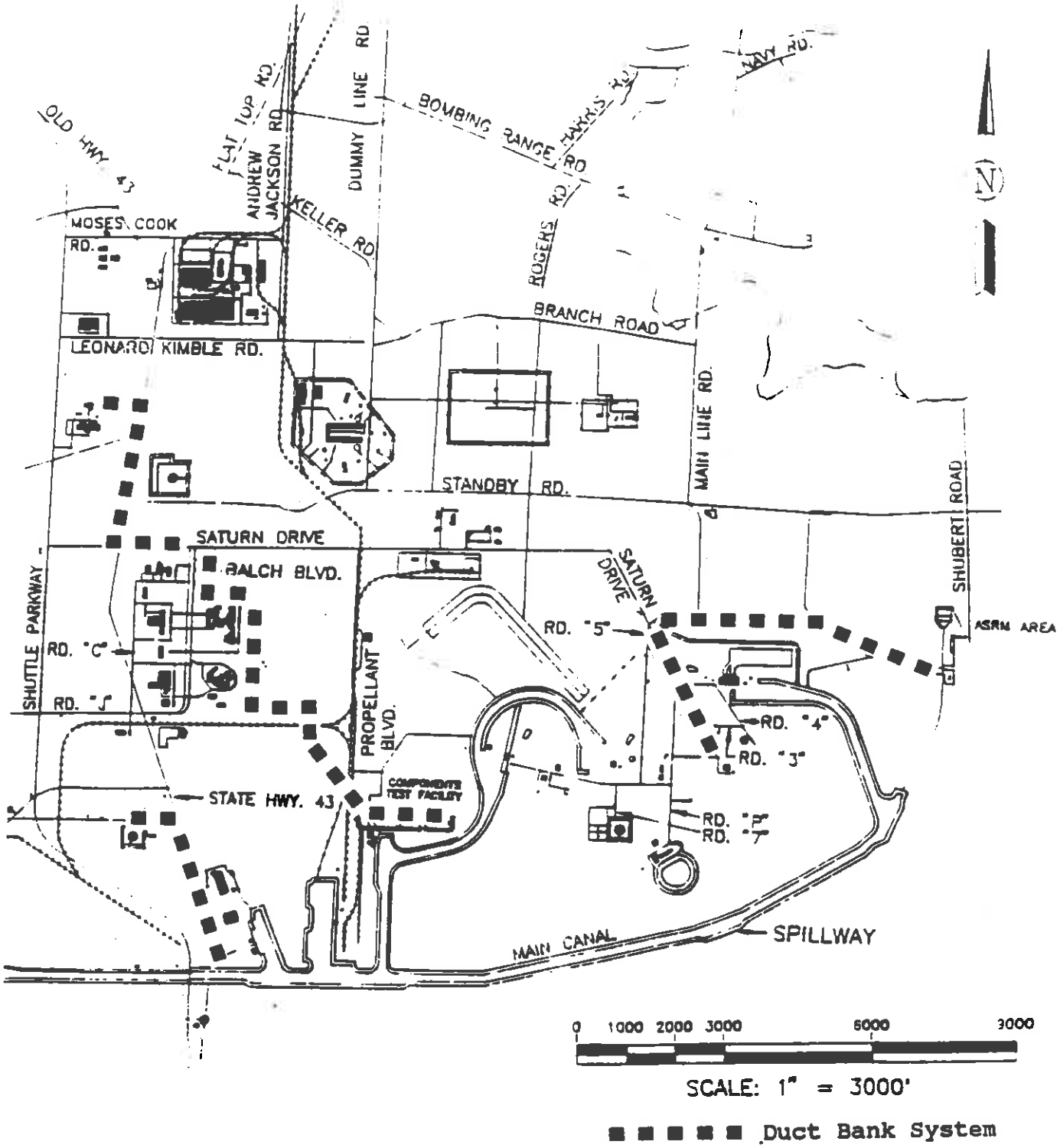
9 Keiser, E. and P. Lago. Survey of the Amphibians, Reptiles, Birds, and Mammals on the 3,000 Acre Space Center ASRM site, Final Report. October, 1991.

10 Wooten, J.W. A Fall Botanical Study of a Portion of the National Aeronautics and Space Administration Installation. Stennis Space Center, Mississippi. Parts I and II. October, 1991.

11 King, Cindy. Sverdrup Technology Inc., Stennis Space Center, Botanist. Conversation of May, 1994 on botanical surveys for Stennis Space Center.

[12] Clark, Andrew. NASA, Center Operations, Stennis Space Center, Engineering. Telephone conversation of April, 1994 on protected species in the Component Test Facility vicinity.

[13] U.S. Army Corps of Engineers. Cultural Resources Investigations for National Aeronautics and Space Administration at National Space Technology Laboratories, NSTL, Mississippi. U.S. Army Corps of Engineers, Mobile District. May, 1988.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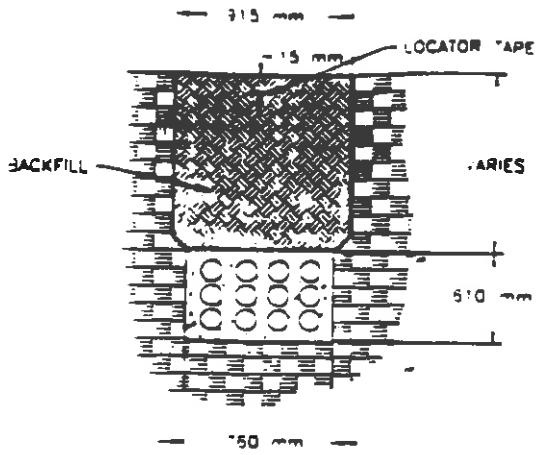
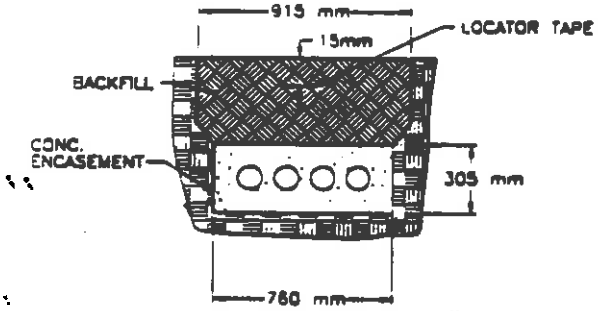
FLAT TOP RD.
ANDREW JACKSON RD.
DUMMY LINE RD
BOMBING RANGE RD
NAVY RD.
ROGERS RD.
KELLER RD.
MOSES COOK RD.
LEONARD KIMBLE RD.
BRANCH ROAD
MAIN LINE RD.
STANDBY RD.
SHUBERT ROAD
SATURN DRIVE
BALCH BLVD.
SHUTTLE PARKWAY
RD. "C"
RD. "D"
PROPELLANT BLVD.
COMPONENTS TEST FACILITY
STATE HWY. 43
RD. "5"
RD. "4"
RD. "3"
RD. "2"
RD. "1"
ASRM AREA
MAIN CANAL
SPILLWAY
N
0 1000 2000 3000 6000 9000
SCALE: 1" = 3000'
Duct Bank System

Figure 1



TYPICAL 12 CONDUIT DUCTBANK

N.T.S



TYPICAL 4 CONDUIT DUCTBANK

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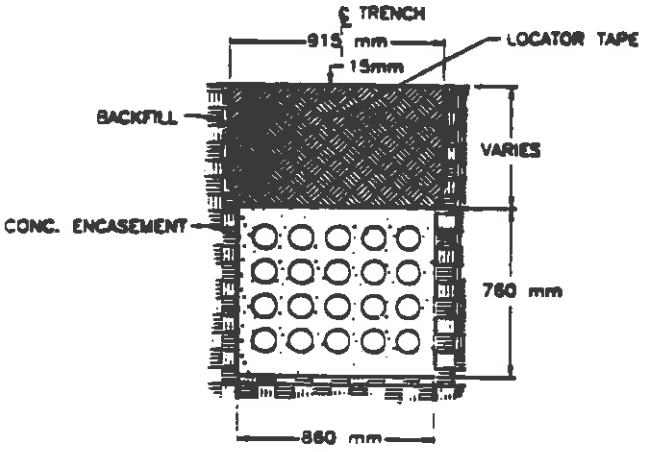

TYPICAL 20 CONDUIT DUCTBANK

N.T.S

Figure 2